

## CLAIMS

1. Device for determining the position of an in particular metallic target (50), particularly for performing the method according to one of the claims 19 to 27, with at least two detection devices (14, 24, 34) which are so positioned along a path (51) to be monitored that the sensitivity curves (15, 25, 35) of immediately adjacent detection devices (14, 24, 34) at least partly overlap, the detection devices (14, 24, 34) having in each case at least one inductivity (16, 26, 36) and at least one oscillator (18, 28, 38) and, as a function of a distance of the target (50) from the detection device (14, 24, 34), supply a distance signal, with at least one converting device (19, 29, 39, 59) operatively connected to the detection devices (14, 24, 34) for converting the distance signals detected by the detection devices (14, 24, 34) into analog signals, particularly current and/or voltage signals, and with at least one evaluating device (52) operatively connected to the converting device or devices (19, 29, 39, 59) for determining and reading out a local position of the target (50) from analog signals going back to the particular detection devices (14, 24, 34),  
characterized in that  
the detection devices (14, 24, 34) in each case output an oscillator damping signal as the distance signal.
2. Device according to claim 1,  
characterized in that  
a damping curve of a detection device (14, 24, 34) in each case has partial areas with a high positional resolution and that the detection devices (14, 24, 34) are so positioned that a detection curve for the entire path to be monitored can be composed from the partial areas of high

resolution of the individual detection devices (14, 24, 34).

3. Device according to claim 2, characterized in that  
in the partial areas of high positional resolution the positional resolution is everywhere greater than 10%, preferably everywhere greater than 20% and in particularly preferred manner everywhere greater than 40% of the maximum positional resolution.
4. Device according to one of the claims 1 to 3, characterized in that  
the detection devices (14, 24, 34) are equidistantly arranged along the path.
5. Device according to one of the claims 1 to 4, characterized in that  
there is a guide device for guiding the target (50) along the path to be monitored.
6. Device according to one of the claims 1 to 5, characterized in that  
there is a target (50) movably positioned in the guide device.
7. Device according to one of the claims 1 to 6, characterized in that  
the detection devices (14, 24, 34) are so positioned along the path to be monitored that they are in each case only partly coverable by the target (50).

8. Device according to one of the claims 1 to 7,  
characterized in that  
the detection devices (14, 24, 34) are so positioned along  
the path to be monitored that they are in each case only  
90%, preferably only 85% and in particularly preferred  
manner only 80% coverable by the target (50).
9. Device according to one of the claims 1 to 8,  
characterized in that  
the dimensions of the target (50) are so chosen or formed  
that an individual detection device (14, 24, 34) can only  
be partly covered by the target (50).
10. Device according to one of the claims 1 to 9,  
characterized in that  
the target (50) is a small metal plate.
11. Device according to one of the claims 1 to 10,  
characterized in that  
the detection devices (14, 24, 34) are located in a row.
12. Device according to one of the claims 1 to 11,  
characterized in that  
the detection devices (14, 24, 34) are in each case posi-  
tioned in displaced manner in two parallel rows.
13. Device according to one of the claims 1 to 12,  
characterized in that  
with each detection device (14, 24, 34) is associated a  
converting device (19, 29, 39, 59).

14. Device according to one of the claims 1 to 12,  
characterized in that  
there is at least one multiplexer (54) between a converting device (59) and a plurality of detection devices (14, 24, 34).
15. Device according to one of the claims 1 to 14,  
characterized in that  
the inductivities (16, 26, 36), particularly the coils of the detection devices (14, 24, 34) are arranged with their axes transverse, particularly perpendicular to the path (51) to be monitored.
16. Device according to one of the claims 1 to 15,  
characterized in that  
the inductivity (16, 26, 36) is provided as part of the oscillator (18, 28, 38) in at least part of the detection devices (14, 24, 34).
17. Device according to one of the claims 1 to 16,  
characterized in that  
the detection devices (14, 24, 34) are so positioned that the areal overlap of the sensitivity curves (15, 25, 35) or damping curves of mutually adjacent detection devices (14, 24, 34) is between 20 and 50%, particularly between 25 and 35%.
18. Device according to one of the claims 1 to 17,  
characterized in that  
the detection devices (14, 24, 34) can in each case determine a radial spacing of the target (50) from an axis of the inductance coil (16, 26, 36).

19. Method for determining the position of an in particular metallic target (50), in which at least two detection devices (14, 24, 34) are so positioned along a path (51) to be monitored that the sensitivity curves (15, 25, 35) of directly adjacent detection devices (14, 24, 35) at least partly overlap, the detection devices (14, 24, 34) supplying a distance signal as a function of the distance of the target, in which the distance signals determined by the detection devices (14, 24, 34) are converted by at least one converting device (19, 29, 39, 59) into analog signals, particularly current and/or voltage signals and in which from the different analog signals going back to the respective detection devices (14, 24, 34) the position of the target (50) is determined, characterized in that the distance signal is in each case constituted by damping signals of oscillators of detection devices (14, 24, 34).
20. Method according to claim 19, characterized in that the detection devices (14, 24, 34) are positioned in such a way that a detection curve for the entire path to be monitored can be composed from partial areas with a high positional resolution of the damping curves of the individual detection devices (14, 24, 34) and that for determining the position of the target (50) the measured damping values can be compared with previously, particularly punctiform recorded teach-in data.
21. Method according to claim 20, characterized in that for recording the teach-in data the target (50) is guided along the path to be monitored, the position of the target (50) and the respective damping signals of the detection devices (14, 24, 34) being locally recorded.

22. Method according to one of the claims 20 or 21, characterized in that on recording the teach-in data the position of the target (50) is also varied transversely to the path to be monitored and the respective positions and damping signals are locally recorded.
23. Method according to one of the claims 19 to 22, characterized in that the detection device with the second highest damping is used for evaluating the damping signal.
24. Method according to one of the claims 19 to 23, characterized in that the sensitivity curves (15, 25, 35) of the detection devices (14, 24, 34) are standardized.
25. Method according to one of the claims 19 to 24, characterized in that for evaluation purposes use is made of a pair of values consisting of the damping signal with the second highest and the highest damping.
26. Method according to one of the claims 20 to 25, characterized in that for determining the position of the target (50) interpolation takes place between points of the teach-in data.
27. Method according to one of the claims 20 to 26, characterized in that portions of the damping curves are in each case approximated by lines for evaluation purposes.

28. Method according to one of the claims 19 to 27, characterized in that  
for evaluation purposes, in each case, account is taken of only one portion of a detection device (14, 24, 34) or that several detection devices (14, 24, 34) are simultaneously evaluated and in particular ratios are formed from the analog signals.